Offline 3 Report
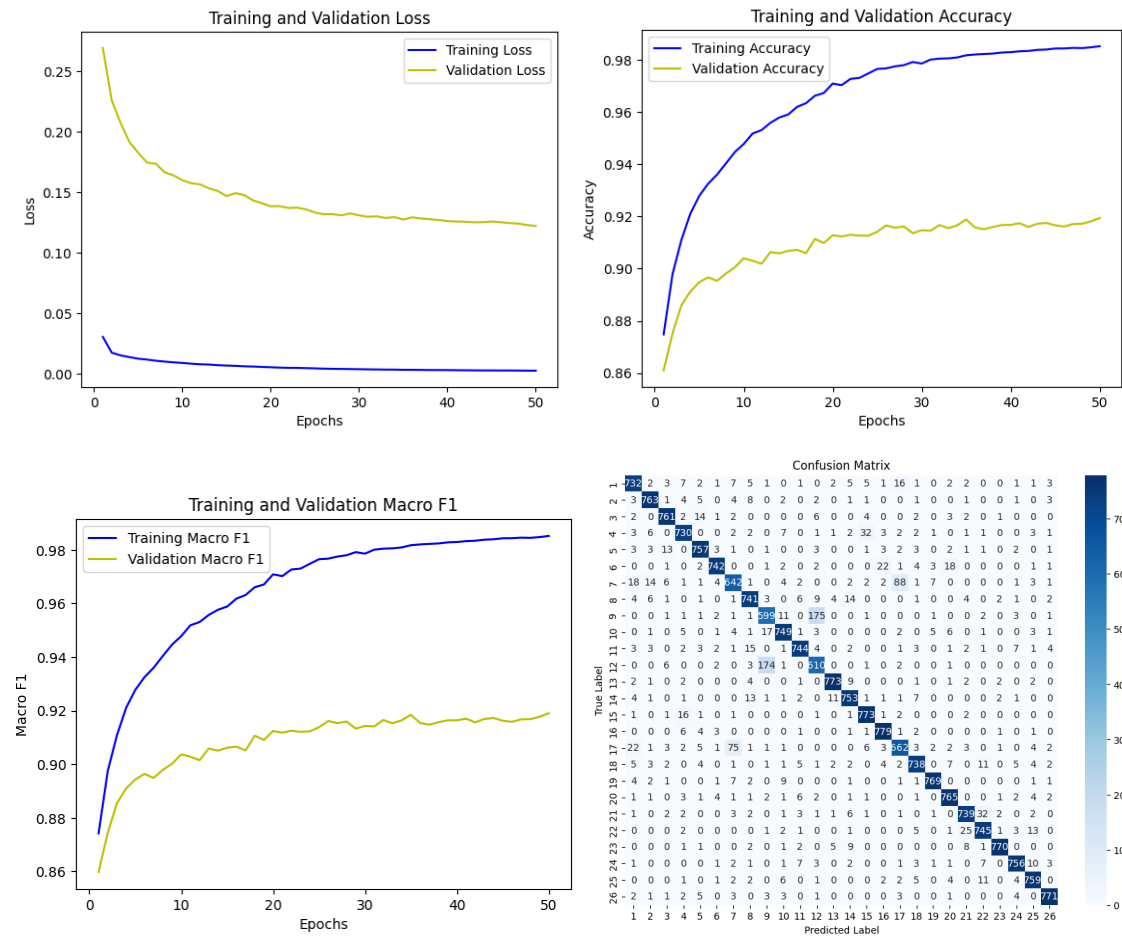
1805012 - Aszadur Rahman Rakin

Hyperparameters

1. Learning Rates   5e-3, 1e-3, 5e-4, 1e-4
2. Batch_size   1024
3. Epochs   20
4. Weights saved on best macro-F1 score
5. Linear LR Scheduler $(0.95^{epoch})*initial\_learning\_rate$
6. Adam Optimizer
7. Kaiming Initialization [ReLU] , Xavier Initialization [Sigmoid]

Model 1 (Best)

=================

```
Linear(784,512)
ReLU
Dropout(20.0%)
Linear(512,512)
ReLU
Dropout(10.0%)
Linear(512,26)
Softmax
```
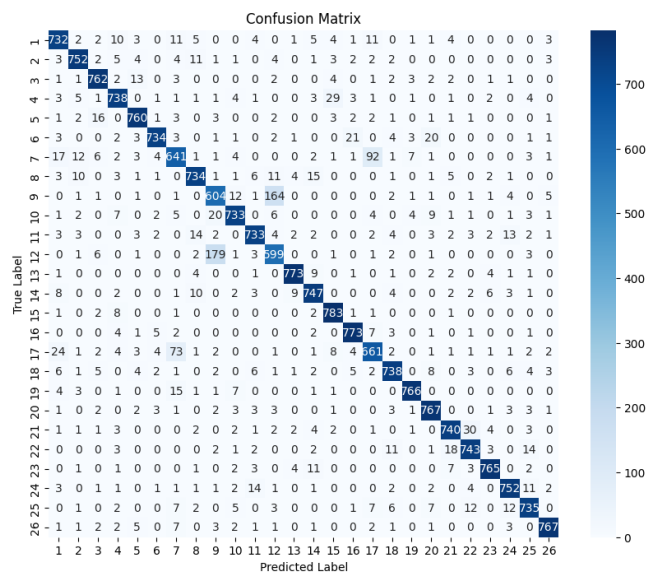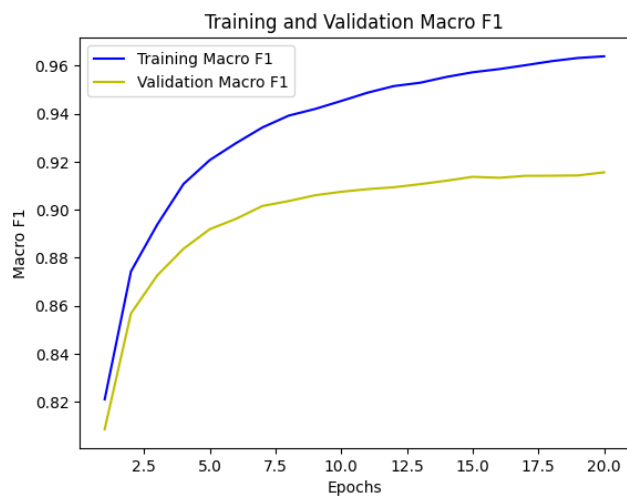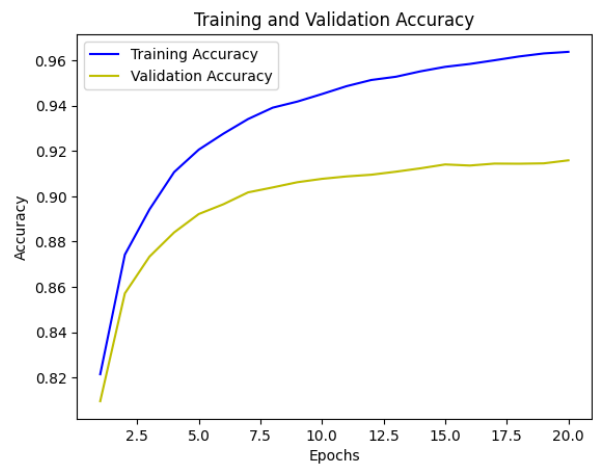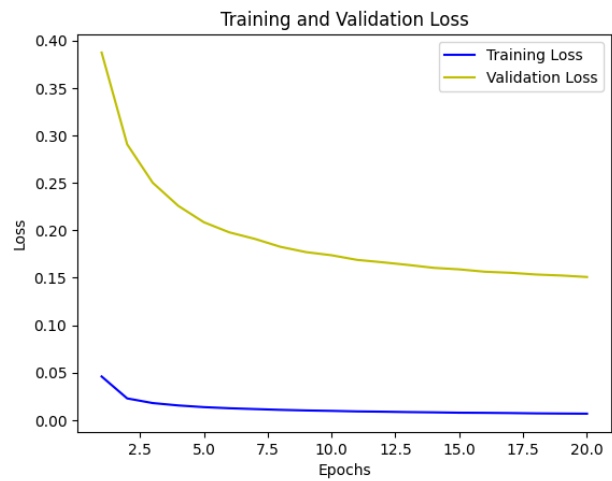
Learning Rate: 5e-3   Test Accuracy:91.93%   Test Macro_F1:91.93%

Training and Validation Loss

Training and Validation Accuracy

Training and Validation Macro F1

Confusion Matrix

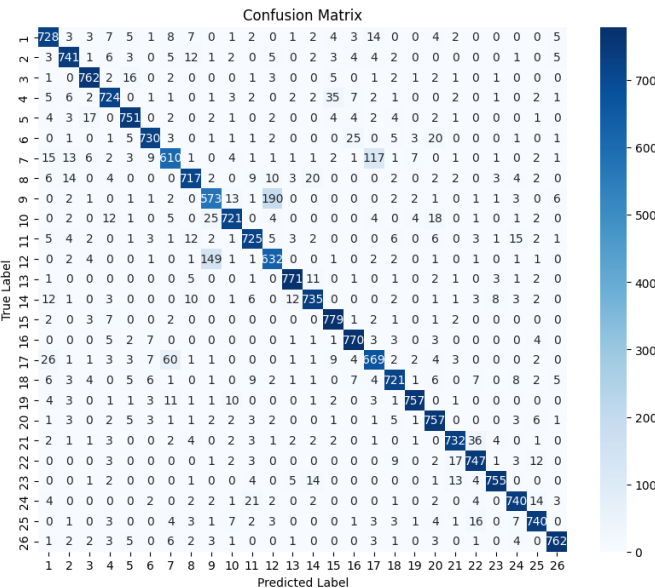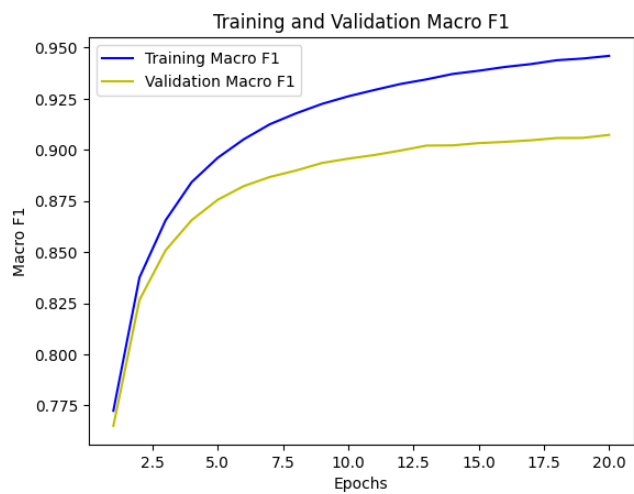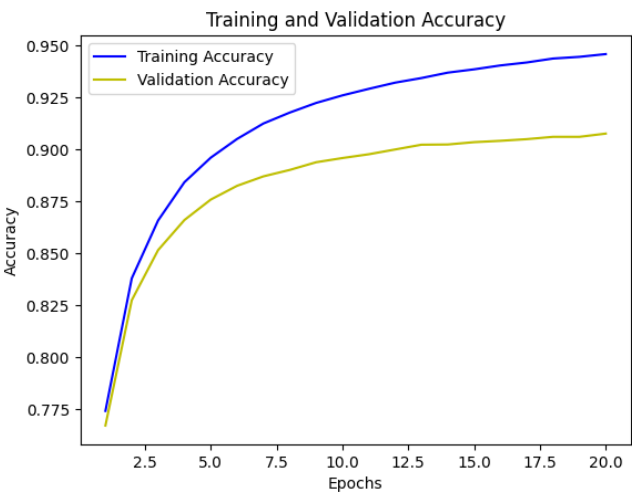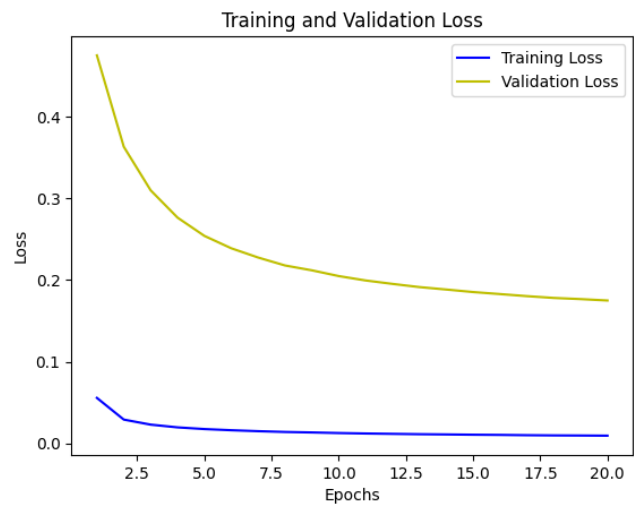Learning Rate: 1e-3   Test Accuracy: 91.5%   Test Macro_F1: 91.508%
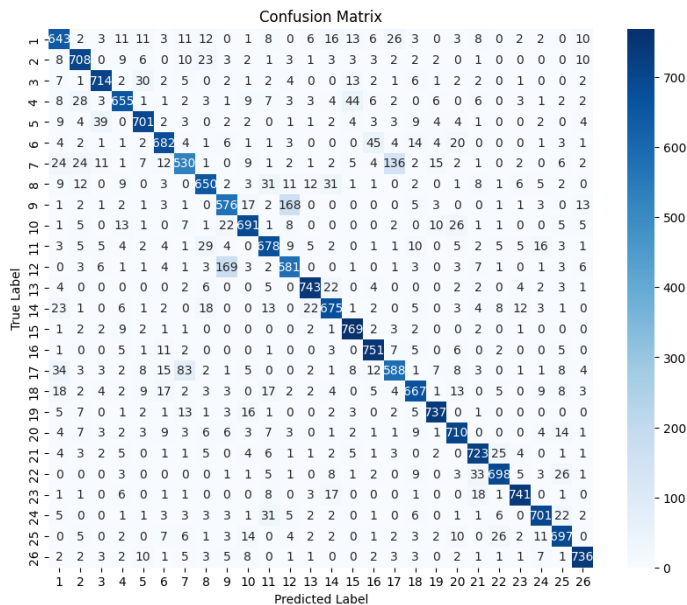
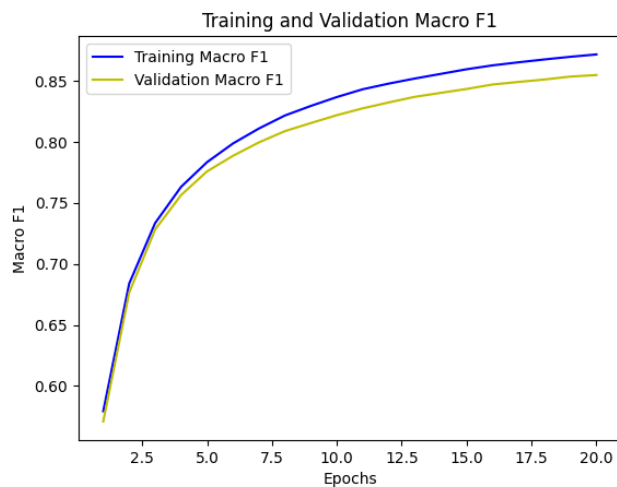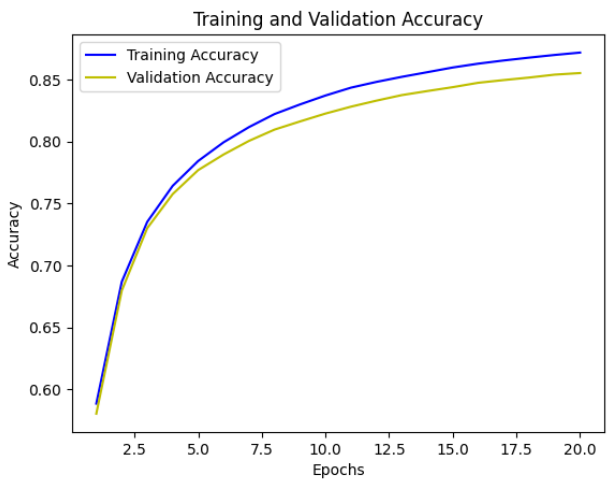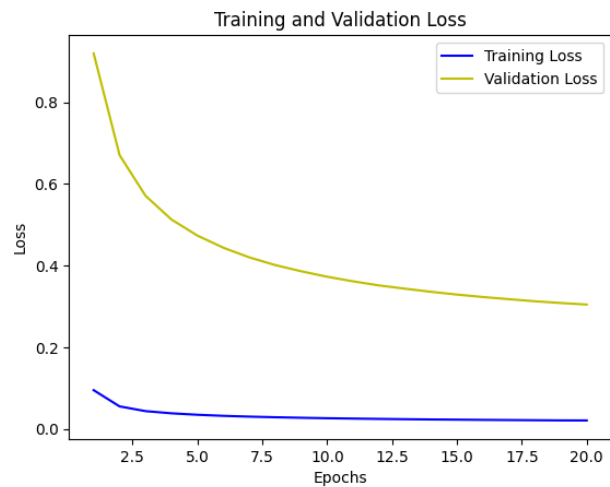Learning Rate: 5e-4   Test Accuracy: 90.62%   Test Macro_F1: 90.616%

Training and Validation Loss

Training and Validation Accuracy

Training and Validation Macro F1

Confusion Matrix

Learning Rate: 1e-4   Test Accuracy: 85.313%   Test Macro_F1: 85.26%

Training and Validation Loss

Training and Validation Accuracy

Training and Validation Macro F1
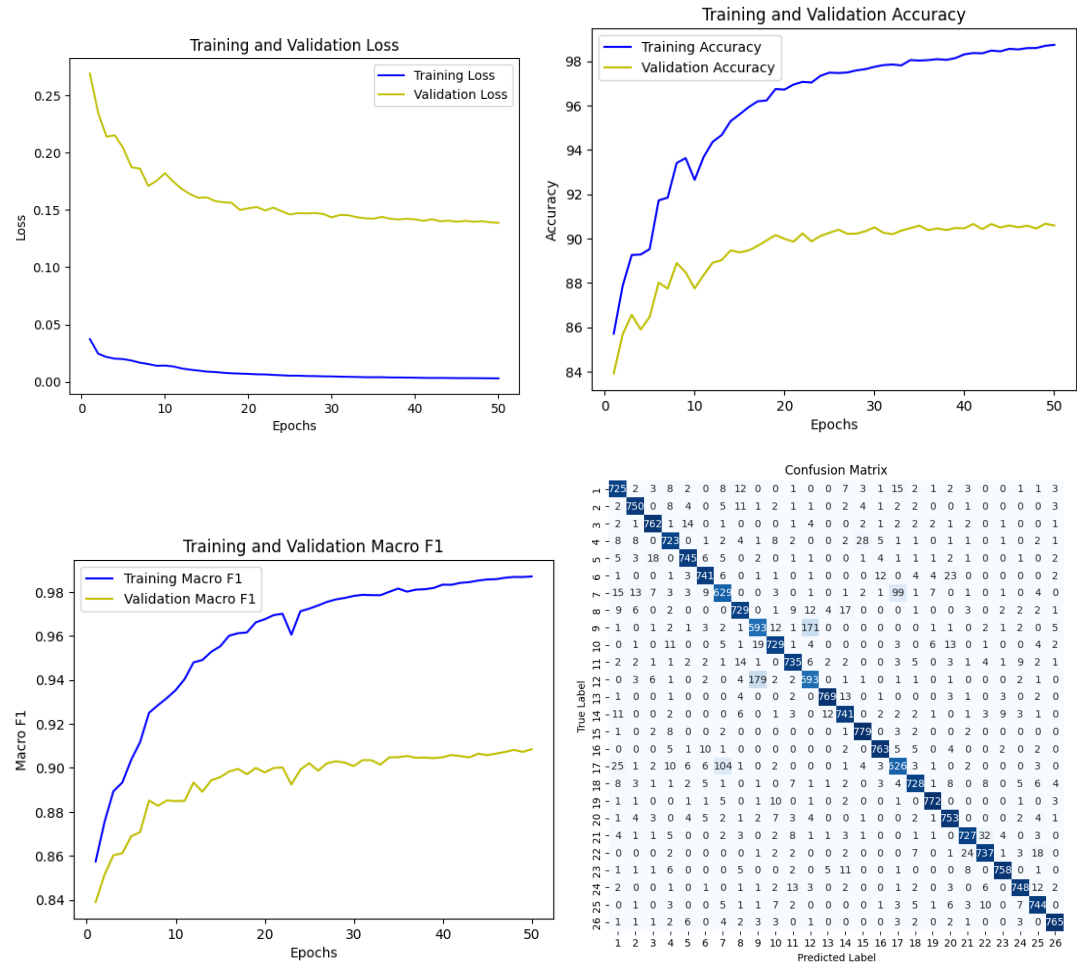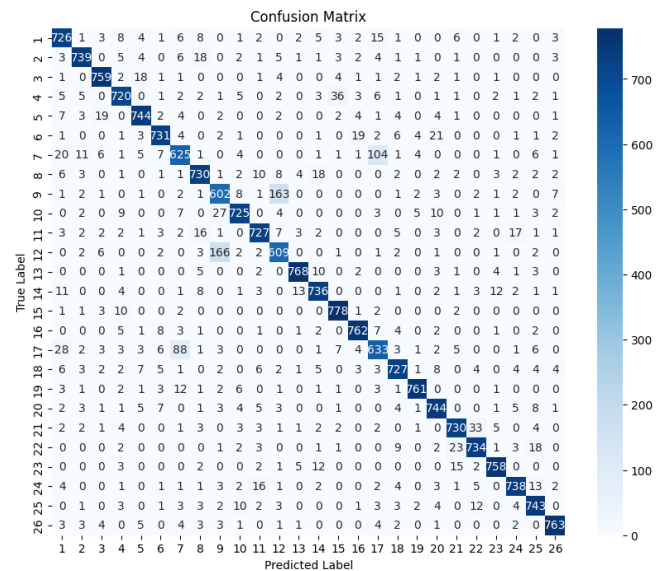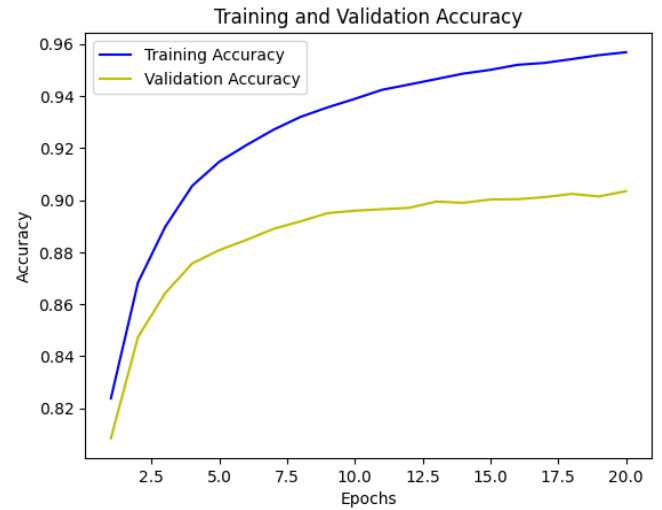
Confusion Matrix

Model 2

===============

```
Linear(784,1024)
ReLU
Dropout(30.0%)
Linear(1024,26)
Softmax
```

Learning Rate : 5e-3   Test Accuracy: 90.7 %   Test macro-F1:90.69%

Training and Validation Loss

Training and Validation Accuracy

Training and Validation Macro F1

Confusion Matrix

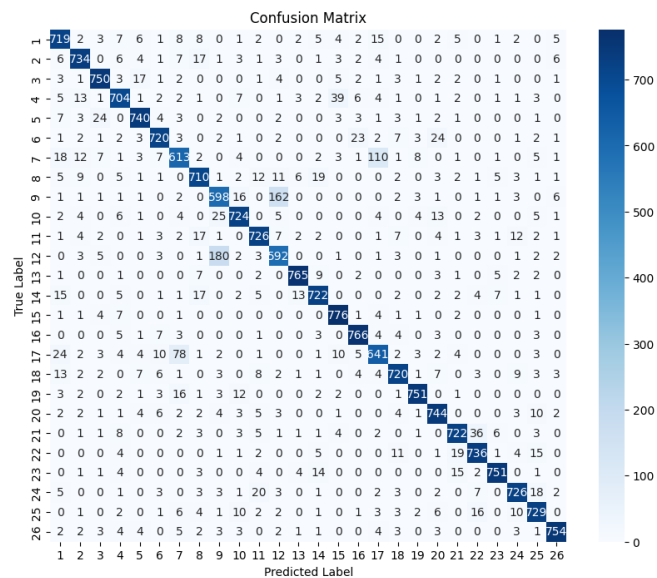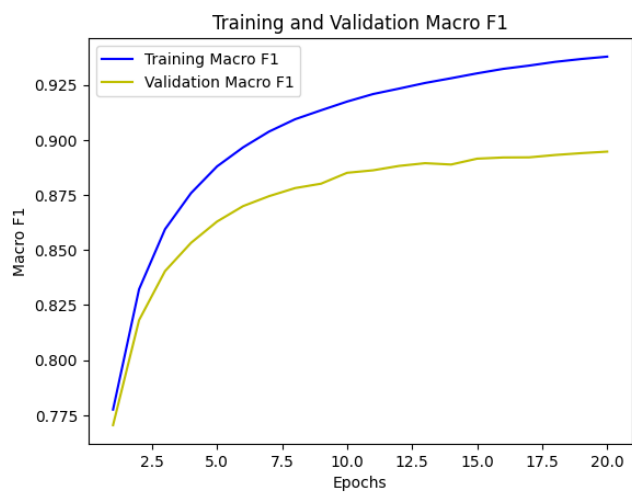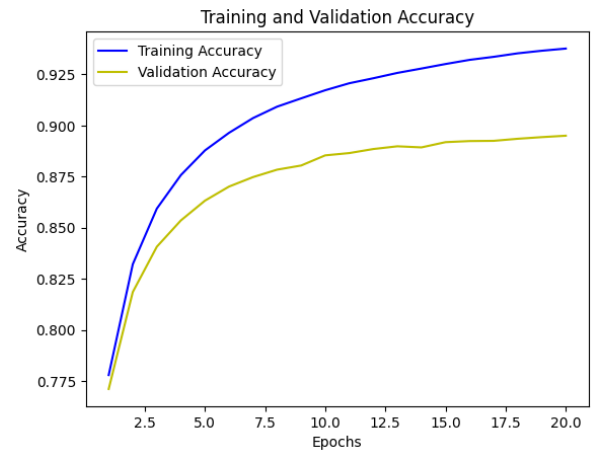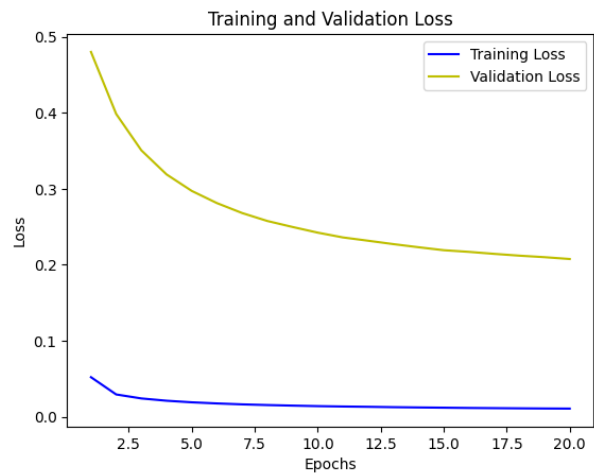# Learning Rate: 1e-3   Test Accuracy: 90.44   Test Macro_F1: 90.45

Learning Rate: 5e-4   Test Accuracy: 89.58%   Test Macro_F1:89.59%
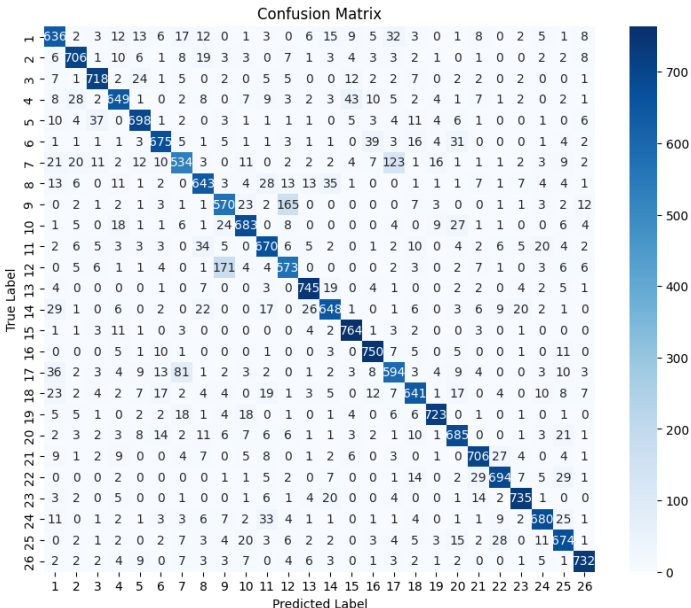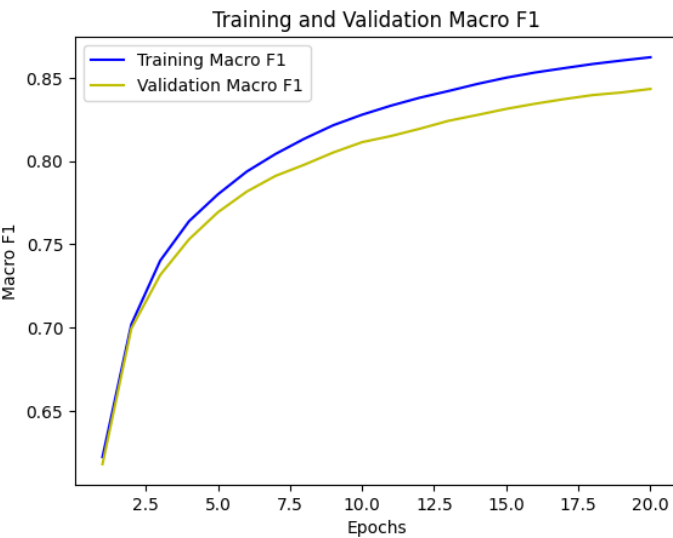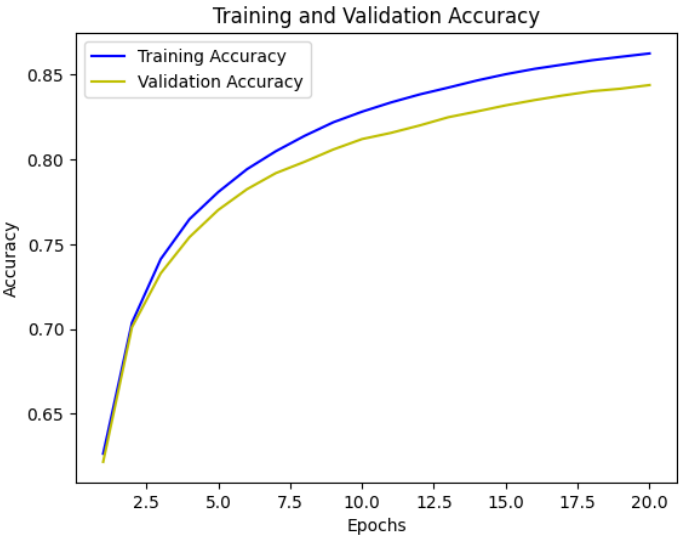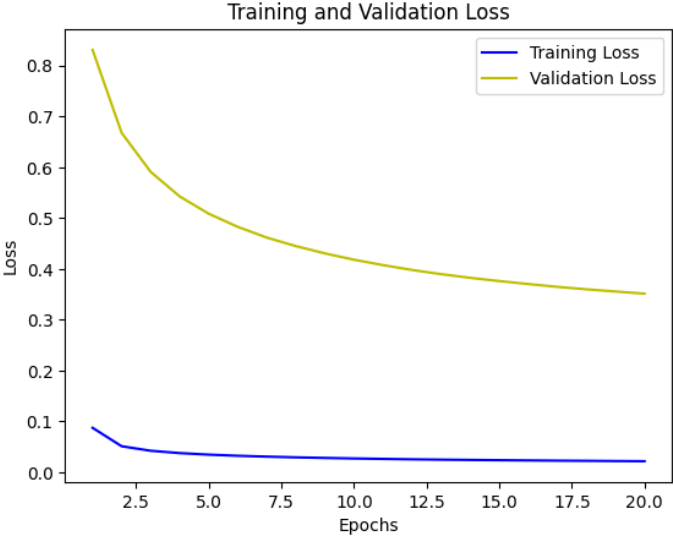
Learning Rate: 1e-4   Test Accuracy: 84.26%   Test Macro_F1: 84.23%
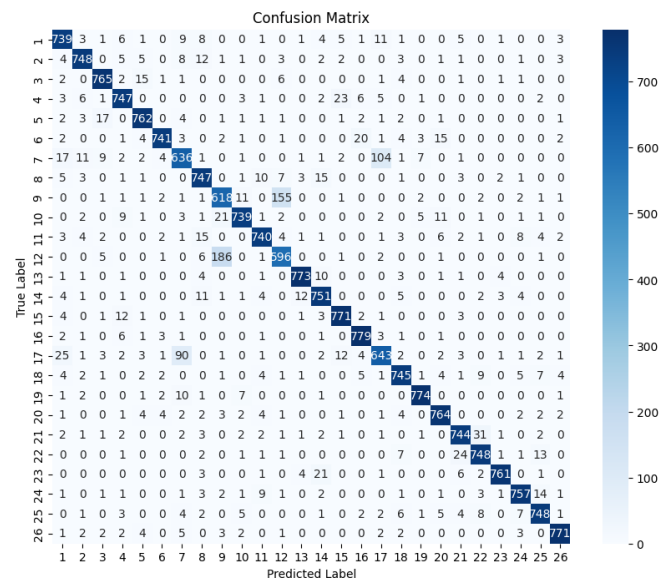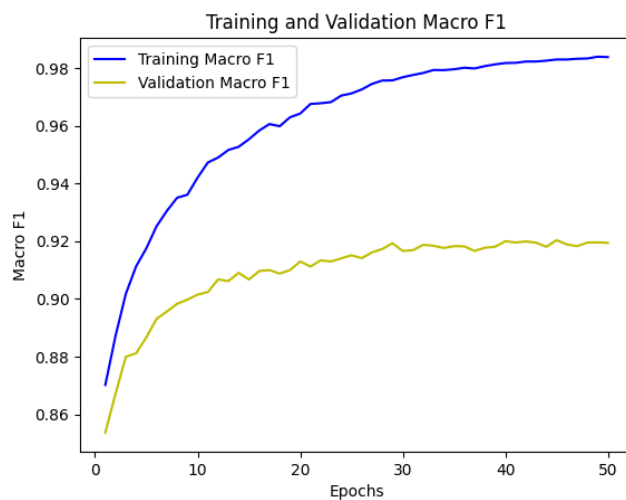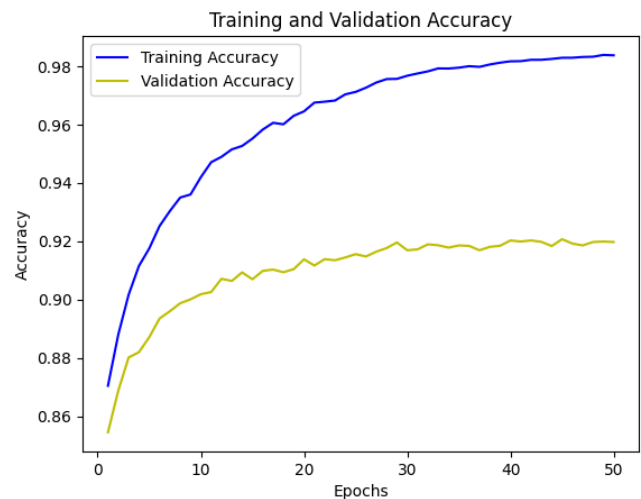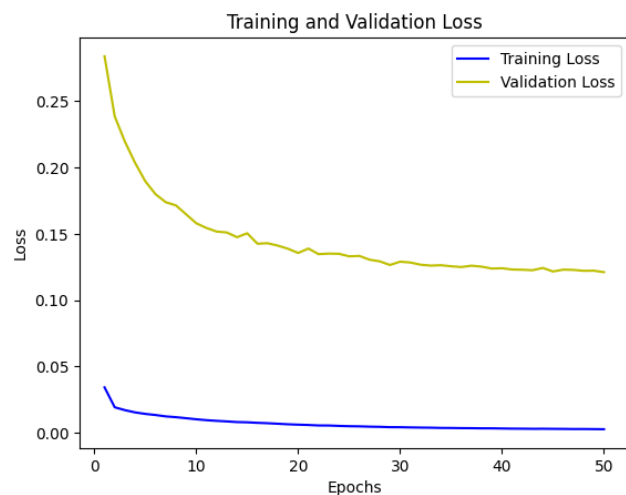
Model 3

=========

```
model=Linear(784,1024)
ReLU
Dropout(20.0%)
Linear(1024,512)
ReLU
Dropout(20.0%)
Linear(512,26)
Softmax
```

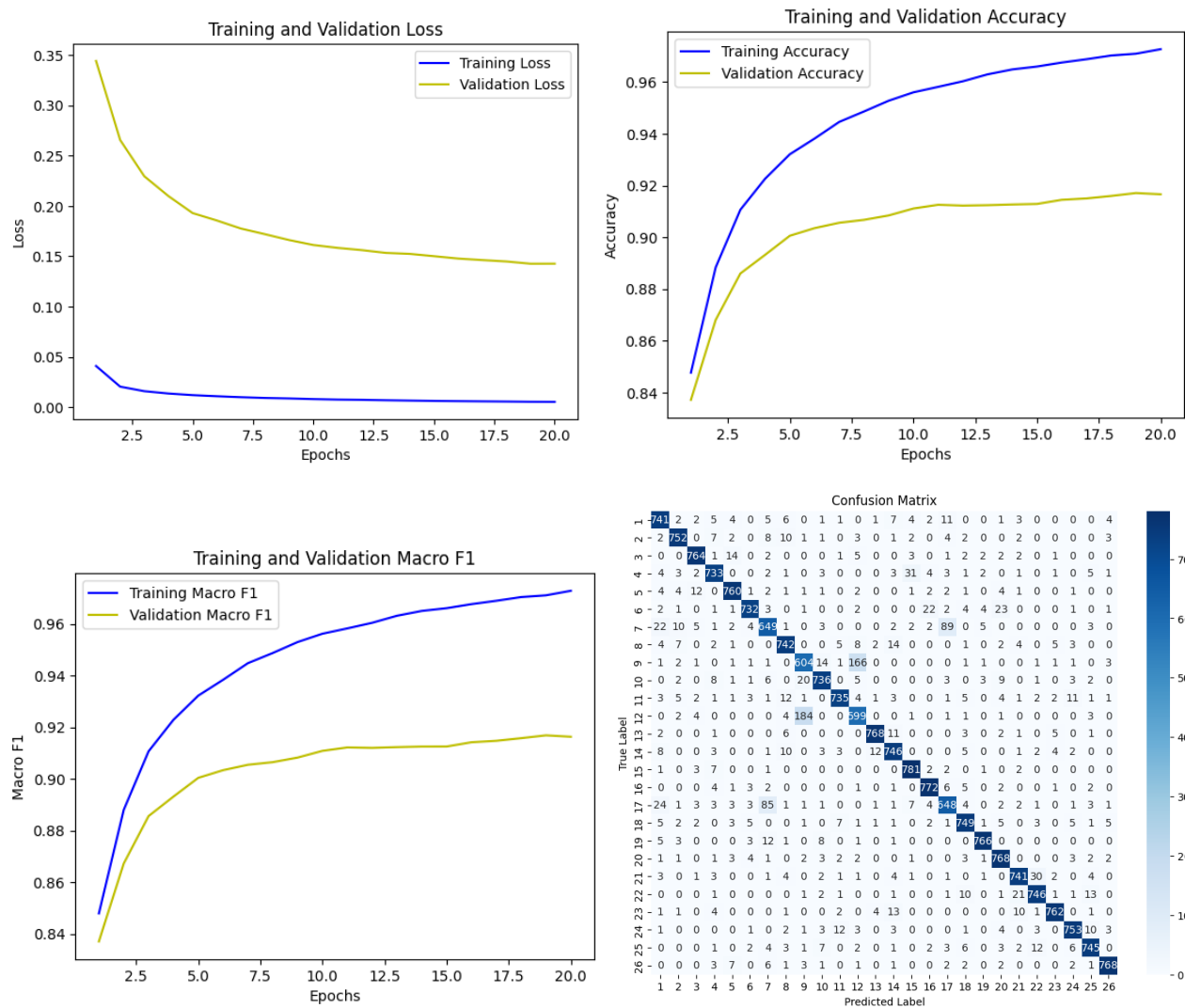Learning Rate: 5e-3   Test Accuracy: 91.86%   Test Macro_F1: 91.86%
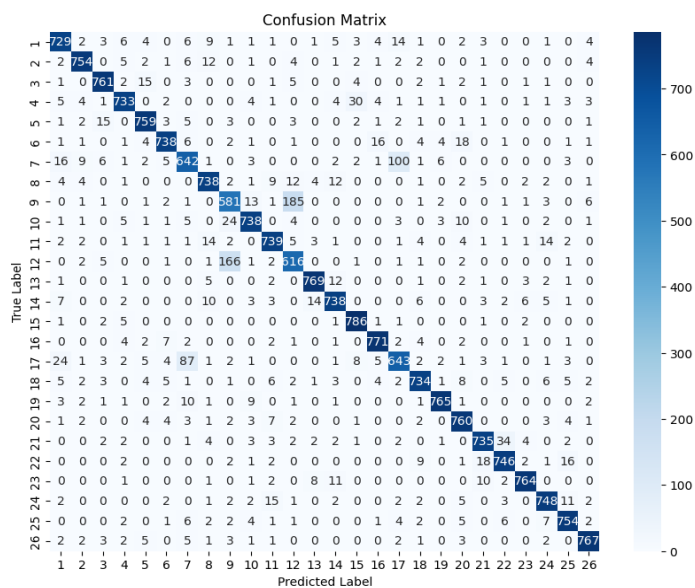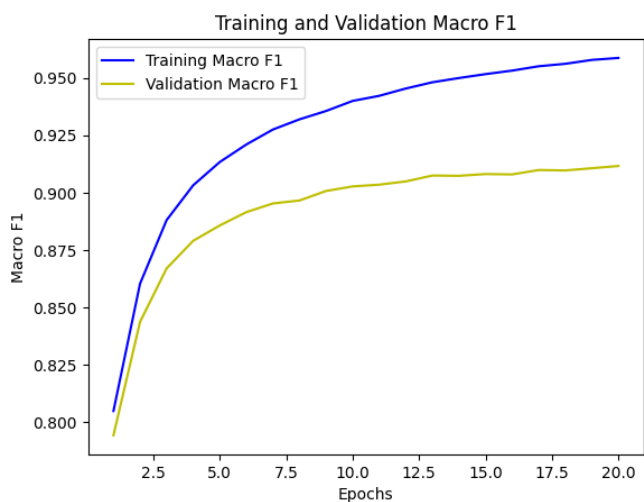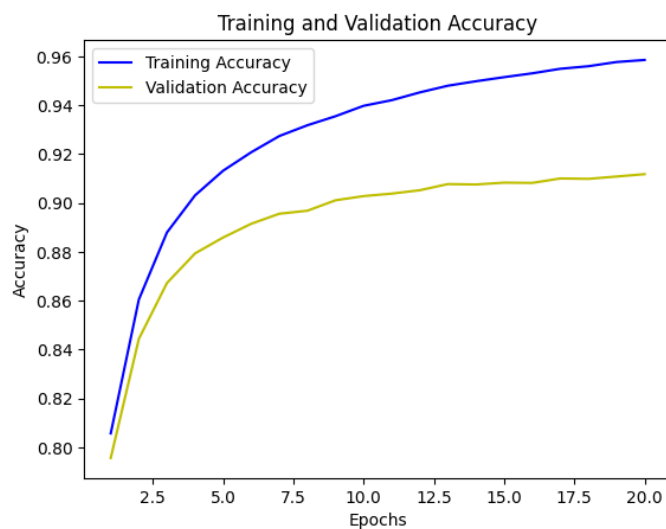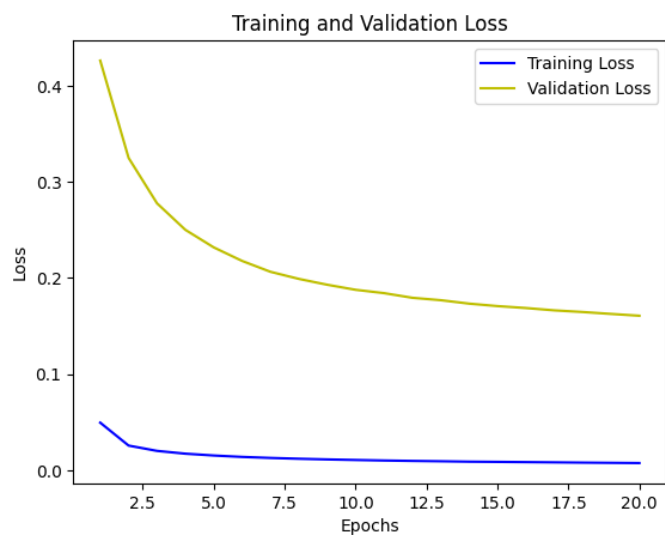
Learning Rate: 1e-3   Test Accuracy: 91.634%   Test Macro_F1: 91.642%

Training and Validation Loss

Training and Validation Accuracy

Training and Validation Macro F1

Confusion Matrix

Learning Rate: 5e-4   Test Accuracy: 91.03%   Test Macro_F1: 91.03%

Training and Validation Loss

Training and Validation Accuracy

Training and Validation Macro F1

Confusion Matrix

Learning Rate: 1e-4   Test Accuracy: 87.053%   Test Macro_F1: 87.024%